PRINCIPLES OF TRANSDUCER DEVICES AND COMPONENTS

Edited by

Sheroz Khan, International Islamic University Malaysia

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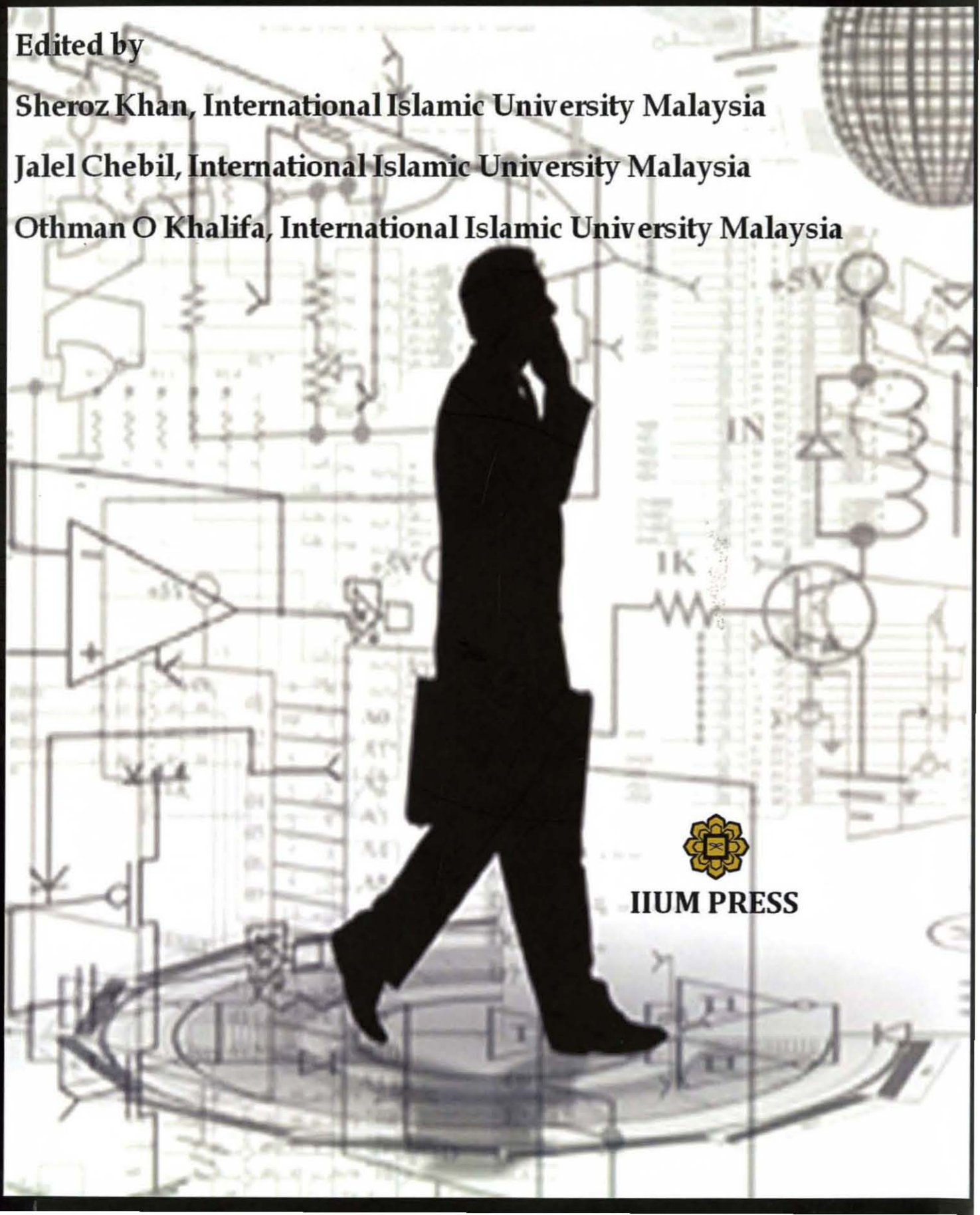

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CONTENTS

Chapter 13

THE PRINCIPLE OF RESISTIVE SENSING

ATIKA ARSHAD, RUMANA TASNIM, SHEROZ KHAN, AHM ZAHIRUL ALAM

13.0 INTRODUCTION

A resistive sensor is a device that is able to sense any change occurred in the parameter of interest due to the change in resistance. Resistive displacement transducer is one of the mostly used transducers. It uses a resistive element with a sliding contact attached to the object the position of which is being monitored.

13.1 RESISTANCE (*R*), MEASURED IN OHMS (Ω)

Resistance is derived from the property of a material due which it opposes the flow of current. As current is the result of the flow of electrons through the material of a conductor, that is why, resistance in fact comes from the friction of electrons are experiencing while moving through the stationary ionic nuclei.

13.2 RESISTIVITY (ρ), MEASURED IN OHM-METER (Ω-m)

The electrical resistance of a wire of length l, cross-sectional area A is given by

$$R = \rho \frac{l}{A} \tag{13.1}$$

Where ρ is called the resistivity of the material of which the conductor is made, given in Ohm-meter. Some materials with their resistivity values are given in Table 13.1.